

ПЕДАГОГИКА ЖӘНЕ ОҚЫТУ ӘДІСТЕРІ

PEDAGOGY AND TEACHING METHODS

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B. Sengerbekova^{1*}, K. Smakova², V. Avasi³

^{1,2} SDU University, Kaskelen, Kazakhstan

³Euclid University, Bangui, the Central African Republic

*e-mail: 212302001@stu.sdu.edu.kz

PROJECT-BASED LEARNING (PBL) IN A CLIL CLASSROOM: THE CASE OF KAZAKHSTAN

Abstract. This study investigated the effects of project-based learning (PBL) on English language development during a biology lesson within CLIL context. The object of the study was PBL, while the purpose of the study was to investigate the effects of PBL on CLIL development in learners. This qualitative research was conducted at three schools in Kazakhstan using three CLIL classes teaching biology in English. Data was collected in parallel through classroom observations and focus group interviews. The research findings revealed that PBL significantly improved classroom climate during CLIL implementation and that both teachers and students perceived PBL positively despite the shortcomings associated with a large time commitment and the difficulty of objectively assessing group performance. The results of the study can help school authorities improve the quality of CLIL practices in light of PBL.

Keywords: *Project-Based Learning, CLIL, teachers, students.*

Introduction

As the current research focuses on CLIL classes, it was important to investigate the impact of PBL on language and content acquisition within the CLIL approach. According to J. Lee et al. (2014), most studies on CLIL are concerned with content acquisition rather than language acquisition, and therefore, language is rarely addressed in the context of CLIL [1]. In this regard, PBL is seen as an appropriate tool to address both content and language acquisition by involving students in the learning process and engaging them in activities from goal setting to progress monitoring. In implementing project-based learning, the teacher serves as a guide or facilitator rather than the primary source of information and students become active participants in the learning process. However, most studies show that teachers' views on PBL in the context of CLIL are the least researched compared to previous studies [2]. Therefore, our study aims to analyse students' and teachers' views on PBL in

foreign language learning in the context of CLIL and to conduct a comparative analysis of the CLIL classroom environment before and after the introduction of PBL as a teaching strategy.

The use of project-based learning (PBL) in traditional classrooms has gained popularity in recent years [3]. Project-based learning as a form of instruction allows students to direct their own learning through inquiry by collaboratively researching and creating projects that demonstrate their understanding [4]. In this instructional approach, students are often assigned a project to develop their ability to collaborate with other students [5]. In this regard, collaboration or group work can be challenging for teachers when it comes to assessing students' individual contributions to the project [6]. This can be solved by creating effective assessment criteria for the students involved in the project work because, despite certain challenges, PBL increases students' engagement in the learning process [7] and serves as a source of motivation for students inside and outside the classroom [8].

In a PBL classroom, students can plan, work and present in a group under the guidance of a teacher [2]. Students are often required to present their work to their classmates at the end of the term to share their views [2]. Rather than relying solely on the teacher's explanations, as is the case with traditional teaching methods, PBL provides a circumstance where the learning process is more engaging and reality-based [1].

The basic idea of PBL is that learning begins with a problem presented in the same context in which it would occur in real life. Therefore, PBL offers many opportunities to improve language use and acquisition in real-life scenarios [9]. This means that what is learnt in the classroom can be used immediately to solve problems in the real world. Because they have learnt and practised in class, students are better prepared to deal with challenges in the real world. Therefore, compared to learning something that does not occur in real life, it offers greater benefits to students [10].

PBL involves a series of steps. According to F. Stoller (2002), the instructional steps of PBL are as follows:

Step 1: Students and teacher decide on a project topic and determine the project outcome;

Step 2: The students and the teacher plan the project steps;

Step 3: The teacher gives the students the requirements for collecting information;

Step 4: Students collect data;

Step 5: The teacher encourages the students to analyse the data;

Step 6: Students carry out the data analysis;

Step 7: The teacher introduces the presentation requirements for the final activity to the students; and

Step 8: Students present their project and then evaluate it [11].

In Kazakhstan, where PBL has been introduced for several years, there are some studies that demonstrate the effectiveness of PBL in the CLIL context

[12]. However, the studies show that the majority of teaching and learning practices, including CLIL, use the lecture style as the primary teaching style [12]. According to a preliminary study, this teaching approach often leads to bored students as they only pay attention to the teacher's explanations. In such classrooms, the teacher serves as the main source in this learning environment, making it teacher-centred rather than student-centred. In this context, the educational objectives of the National Development Plan presented by the MoES RK in 2010 provide students with additional opportunities for self-directed learning with PBL [13]. This document describes PBL as an alternative teaching strategy that provides students with independent learning opportunities and allows the teacher to act as a guide or facilitator rather than a controller. This view was also supported by N. Astawa et al. (2017), who stated that PBL promotes students' passion, confidence, self-directed learning and collaborative learning [14].

In addition, N. Azman and L. Shin (2012) investigated the use of PBL in language learning and students' attitudes towards the use of PBL in language teaching and found that they have a positive attitude towards it [15]. In the same vein, A. Kavlu (2015) also pointed out that the use of PBL makes the reading and vocabulary acquisition process more enjoyable [16]. In addition, S. Chu et al. (2017) observed that students learnt with more vigour and enthusiasm when PBL was used as part of the CLIL approach to teaching content and language [17]. It can be concluded that both Kazakhstani and Western researchers agree that PBL is more exciting and encouraging than the teacher-centred approach. Therefore, not only the content but also the language acquisition should be studied in the context of PBL in CLIL, since CLIL is a dual-focus approach.

Methods and materials

This study investigated the effects of project-based learning (PBL) on English language development during a biology lesson. The aim of the study was to investigate the ways how PBL influences learners' CLIL development. PBL is the approach that gives students the opportunity to learn independently. Employing qualitative research design, three CLIL classes teaching biology in English in three different Kazakhstani schools were selected for the study. The schools were selected for the study based on the researchers' local knowledge of the context. The methodological choice of procedure was the multiple-case design to investigate the changes that occurred in the observed classrooms after the introduction of PBL over a three-month period. Data were collected in parallel through classroom observations and focus group interviews. The demographic data of the schools are listed in Table 1.

Table 1. Demographics of the schools

Characteristics	School A	School B	School C
1. Type of school	Urban (state)	Urban (private)	Rural (state)
2. Students' academic level	Average	High	Low
3. Pre-study teaching approaches	Lecturing	Textbook-based, lecturing	Textbook-based

Ninety-seven students (six of whom were selected for an interview) from three different classes and schools and a total of three CLIL teachers took part in this study. The observations revealed that in the CLIL classroom, the teaching and learning process followed the lecture method before the introduction of PBL was observed. Thus, two traditional lessons were held before the introduction of PBL. The teaching environment before and after the introduction of PBL was compared based on the observation data.

The teaching and learning process in two CLIL lessons per class was observed to determine how PBL was implemented there. Table 2 provides an overview of the classroom activities that included elements of PBL teaching.

Table 2. PBL elements used in the CLIL classroom

Lesson	Activity
1	<p>The learners watched a video in which students drew a human skeleton.</p> <p>They questioned the information in the video.</p> <p>In the presence of their teacher, they discussed the creation of a poster with a human skeleton.</p> <p>In groups of five, they examined and compared the skeletons of different creatures.</p> <p>The contrasts between the skeletons were explored by them and the teacher.</p> <p>They discussed the problems that vertebrates face on a daily basis.</p> <p>They chose a particular bone problem to create a poster about.</p> <p>They sent a video of the project progress to their teacher via the form.</p>
2	<p>In front of the class, the student group presented their poster to their classmates.</p> <p>The teacher and the other groups gave feedback on their project.</p>

The teacher led a reflection on the student groups' presentations.

For each class, the observation was carried out over the course of two CLIL lessons. During these lessons, the teaching-learning processes, student participation, student performance, and the learning process itself were observed. In addition, the researchers observed the teaching-learning process, recorded it, took notes and completed the form provided. To avoid data loss, the results were recorded immediately after the observation. After our observation period of six lessons (two hours per class), the data was analysed using M. Miles et al.' (2014) interactive model, which includes data collection, data summarisation, data presentation and conclusion [18]. To avoid research bias, we analysed the data separately using thematic analyses. Thus, the data was analysed based on four themes: Teaching methods, learning process, student engagement and student outcomes.

As mentioned earlier, six students from the three classes and three teachers participated in semi-structured interviews to corroborate the findings of the study and to understand how the participants perceived the CLIL lessons with PBL. Before the interview began, the participants were informed about the purpose of the study, the process of the study and the benefits of participating in this study. At the request of the participants, the focus group interviews were conducted in a quiet room in the schools. Once the data had been collected and transcribed, the data analysis centred on teachers' and students' perceptions of the advantages and disadvantages of using PBL in CLIL lessons. To ensure the credibility of the data, the results were then discussed with the participants. Finally, a conclusion was drawn based on the results.

Findings

The changes in the participating CLIL classes after the introduction of PBL

This section presents the information gathered from classroom observations over one term (three months). The changes in the participating classes after the introduction of PBL in three schools are compared in Table 3-5, including their characteristics before and after the introduction of PBL. Table 3 shows the characteristics of the classroom before and after the introduction of PBL in School 1 (state school in an urban area).

Table 3. The classroom characteristics before and after the implementation of PBL in school 1 (state school located in urban area)

Characteristics	Before implementing PBL	After implementing PBL
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Teaching Methods	The materials from the textbook were explained by the teacher. The teacher often asked the students to answer the questions from the textbook.	The students carried out the project under the guidance of the teacher (student-centred). The project steps, such as the division of the work and the creation of a timetable, were determined in collaboration with the students.
Learning Process	The lesson was completed in the order in which the materials were presented in the textbook.	The lesson was conducted in accordance with the PBL steps.
Student Involvement	The students participate passively in the learning process.	The materials were actively created by the students, who also learn them independently.
Student Outcomes	Reasoning, co-operation, creativity and communication skills were still in their infancy.	Students' ability to think logically, collaborate in teams, be creative and communicate effectively has been improved. Examples include students' ability to think logically to create a useful product, be creative to create a unique product, collaborate in teams, and communicate to convey ideas and project outcomes.

Table 4. The classroom characteristics before and after the implementation of PBL in school 2 (private school located in urban area)

Characteristics	Before implementing PBL	After implementing PBL
Teaching Methods	Lecturing. The teacher often asked the students to answer the questions from the textbook and some additional worksheets.	The students took an active part in the lessons and worked in teams (student-centred).
Learning Process	The teacher taught the lesson to the students using slides from the presentation. The students discussed the topic with their friends. The results of the class discussion were presented.	Students began searching for additional materials (additional sources of knowledge). The students held group discussions. Students recorded and reflected on the results.

The results were presented by the students.

Student Involvement	The students participate passively in the learning process.	The project was actively carried out by the students, who also present the results.
Student Outcomes	Both the language skills and the content knowledge of the pupils corresponded to the average level of the results expected in the curriculum.	The students' logical thinking, co-operative skills and creativity were improved.

Table 5. The classroom characteristics before and after the implementation of PBL in school 3 (state school located in rural area)

Characteristics	Before implementing PBL	After implementing PBL
Teaching Methods	Lecturing. The teacher often asked the students to answer the questions from the textbook. There were only one or two means of communication. The learning mechanism was clear to see. The teacher used only a small selection of teaching aids.	The students actively participated in the lessons and worked in teams (student-centred). Pupils' creativity was developed more in the classroom.
Learning Process	The students answered the teacher's questions. The students listened passively to the teacher's explanations.	The lessons were conducted in accordance with the PBL steps. The students' interest in learning was stimulated by working independently on group projects. When working on the projects, the students collaborated with each other.

Student Involvement	The students participate passively in the learning process.	The materials are actively created by the students, who also learn them independently. The projects on which the students work in their groups have their full attention.
Student Outcomes	Each learner acquired only a few specific skills. The learners lacked originality and creativity.	The students' logical thinking, co-operative skills and creativity were improved.

Notably, the mood in CLIL lessons changed after the introduction of PBL.

Teaching Methods

Before the use of PBL, teachers taught CLIL lessons mainly using traditional methods. Students were asked to answer the given questions after familiarising themselves with the textbook material. Students rarely had the opportunity to interact with other classmates. The only explanations they received came from their teachers. The teacher and students did not talk much to each other either. In addition, the teachers often asked the students to answer questions from the textbook. The teachers then repeatedly confirmed the correct answers on the following days.

After using PBL, the teachers' teaching methods improved. Textbooks were no longer their main source of information. Instead, they used more real-world resources as examples for the students' projects. They also assisted the students in completing the tasks rather than explaining the materials. They almost never asked students to answer questions from the textbook. As a result of their observation and guidance of the students, the teaching-learning process is now more student-centred and motivating.

Learning Process

Before the introduction of PBL, most learning took place through teacher explanations. The teacher's explanations were the only thing the students heard. The classroom was largely silent. The students yawned frequently, which indicated that they were bored and tired. In addition, the class utilised the resources provided in the textbooks. The class relied mainly on the textbook. The teacher usually gave the students the questions to answer and did so in the following days without letting the students discuss the answers.

The way students learn has changed significantly since the introduction of PBL. Before the introduction of PBL, students were passive, but now they talk and interact with other students. They show a willingness to participate in group discussions. To share their thoughts, they searched for materials, talked about their initiatives and created a presentation. When the children participated in the discussions, the class was livelier and louder than before the introduction of

PBL. In addition, the students were not bored as much because they interacted with their friends.

Student Involvement

Before the introduction of PBL, students were only a passive part of the teaching and learning process. The teachers selected the materials, which came from the textbooks. There was hardly any interaction between the students and the teachers. Only a few students approached the teacher with questions. All other students did nothing but remain silent and listen to the teacher's explanations.

Students are more engaged after the introduction of PBL. The teaching and learning processes directly involved the students. They participated in the selection of materials. All groups had the same project topic, but they could choose subtopics according to their preferences. The projects were not entirely in the hands of the teachers, who could organise them as they wished. In addition, the teachers acted as instructors or facilitators, i.e., they stood in front of the class and observed the groups as they carried out the exercises. Interestingly, this development prompted the students to actively ask questions. There was productive communication between the teacher and the students. The groups and the teacher talked about how to successfully complete the projects.

Student Outcomes

Student performance was less satisfactory before the introduction of PBL. Students were not very creative and argumentative. In addition, students' ability to work together in groups and socialise with other students was severely limited as there was no opportunity for effective collaboration. As they were not used to working in a group, their ability to work in a team decreased.

The students' performance improved after the introduction of PBL, especially in the areas of thinking and creativity. This was the result of practising these skills during the introduction of PBL. There, students worked on projects, held group discussions and presented their concepts. They were able to demonstrate their creativity in project development and design. In explaining their projects, the students were also able to develop their argumentation skills. Each group presented their respective initiative, to which the other groups responded with questions.

The students' and teachers' perceptions of project-based learning used in CLIL

This section summarises the information gathered from the interviews with students and teachers about their opinions on the use of PBL in CLIL lessons. They report on their personal experiences of how they see PBL in the context of CLIL.

The students' perception

Compared to previous methods, this strategy generated greater motivation among students to learn both content and language. They found that PBL created an environment in which they could socialise with other students while learning.

Class cohesion was strengthened as a result. It created an engaging and active classroom environment in which students could learn. This is also reflected in the students' responses:

“I enjoy working on the project. It brings us (the students) together. We read together, talk about the project and prepare it together” (Student F).

Another benefit of PBL cited by students was the opportunity to have a relevant learning experience. They created a project about a real object that they felt they had gained real knowledge from. The students' ability to develop new project ideas is the final positive aspect of PBL. Students can later use this skill in other courses as lifelong learning.

“In the real world, we might have to do a project like this, so yeah, I like that better” (Student B).

In addition to the positive aspects of PBL, students also mention some disadvantages. The first is that they had difficulties in scheduling the project. It is difficult to make time decisions and finish the work in the given time because the participants are busy with competing activities.

“Since we (students) have different tasks, it can be difficult to coordinate our schedules so that we can finish our work (the project) on time” (Student E).

Teacher's perception

According to the teachers, PBL encourages students to actively participate in class. They found that students seemed to be more satisfied when PBL was used instead of other teaching strategies. The use of PBL could make lessons more interesting. They confirmed that PBL also improved students' academic performance. Students' logical thinking, creativity, and teamwork improved with the systematic use of PBL: “The students are now more engaged. They also seem to have better cognitive skills” (Teacher B).

Teachers also felt that PBL could help them gain more experience in exploring different teaching strategies and increase their creativity in developing teaching and learning materials. They explained that they used to do the same thing all the time. However, by using PBL, they were able to practise creating engaging products more often. Furthermore, PBL encourages teachers to be more creative when developing lesson plans: “Definitely, yes. I think my creativity as a teacher has increased. In other words: I have started to produce more original and engaging content for my students” (Teacher C).

The teachers present acknowledged that PBL allows each group member to contribute in an undefined way. It was difficult for them to adequately assess student engagement. Since they did not know each student's contribution to the group project, they were somewhat apprehensive about evaluating the students' work. They also found that some students, especially the shy and introverted ones, were not enthusiastic about PBL. They found it difficult to get these students to talk to their classmates and actively participate in group work: “The most difficult aspect of PBL is probably the grading. I do not think I can grade my students fairly. I cannot pay attention to them the whole time they are working on a project” (Teacher A).

Discussion

The aim of this study was to investigate the effects of project-based learning (PBL) on the progress of English language acquisition during a biology lesson in the context of content and language-integrated learning (CLIL). Furthermore, the study aimed to identify the difficulties teachers encounter when implementing PBL in CLIL lessons and the strategies they use to overcome these challenges.

In general, the use of PBL in CLIL has improved teachers' teaching methods. Teachers started to use additional materials from the real world as examples for students' projects instead of relying only on textbooks. Consequently, the introduction of PBL shifted the focus of the teaching and learning process to the students, making it more engaging and stimulating. This result confirms the findings of Astawa et al. (2017) [14], who suggest that PBL increases students' ability for self-directed learning and motivation, especially in the context of CLIL.

Furthermore, the introduction of PBL in CLIL classrooms has led to a change in students' behaviours during the learning process. Before the introduction of PBL, students' behaviour was rather passive. However, with the introduction of PBL, students started to participate actively in dialogue and communicate with their classmates. This was shown in their eagerness to participate in group discussions by preparing various presentations. In addition, students became less bored because they engaged in social interactions with their fellow students. A study conducted by Azman & Shin (2012) found that by encouraging conversations and allowing students to prepare presentations [15], students gain enjoyment from the learning experience through the use of problem-based learning (PBL) in the teaching and learning process. As a result, the students develop stronger bonds with each other.

Our research found that students showed higher levels of engagement after the introduction of PBL. This result confirms research by Y. Mali (2016) [7], which shows that PBL increases student engagement in the learning process. The results also show that PBL improves the classroom atmosphere and enhances students' skills in a way that cannot be achieved with traditional teaching methods. The findings are consistent with research by V. Greenier and V. Greenier (2018) showing that PBL enhances students' problem-solving skills, risk-taking, collaboration, and empathy [3]. This shows that the integration of PBL into CLIL can be effectively implemented and lead to beneficial outcomes for students. In addition, V. Gomez-Pablos et al. (2017) found that PBL serves as a source of motivation for students and encourages their active engagement and participation in classroom activities [8]. The students in this class confirmed that they showed higher motivation to acquire knowledge through PBL compared to other teaching approaches. Nevertheless, an extensive project can lead to a decrease in student motivation [6]. To minimise student boredom while working on a lengthy task, teachers need to carefully consider the duration of the project.

By incorporating PBL into CLIL lessons, students were able to actively engage in activities that improved their conversational, teamwork, and creativity skills. K. Poonpon (2017) came to similar conclusions and found that PBL was effective in promoting students' acquisition of the target language in CLIL [10]. The study found that students favoured PBL over conventional teaching methods for the purpose of acquiring knowledge. However, the results also suggest that the teacher failed to guide the students sufficiently or give them enough time to prepare a project presentation.

Our study shows that PBL offers teachers the advantage of increasing their flexibility in exploring different teaching tactics and increasing their creativity in creating teaching and learning materials. This was confirmed by teachers' words stating that they engage in the same activity over and over again. However, through the use of PBL, they have managed to produce captivating products frequently. This discovery confirms Y. Mali's (2016) observation that PBL encourages teachers to be more creative in formulating lesson plans [7].

When investigating the difficulties teachers face when implementing PBL in CLIL, it was found that teachers realised that PBL allows every member of a group to contribute fully. They were faced with the challenge of accurately assessing student participation. Not knowing each student's individual contribution to the group project, they were somewhat hesitant to evaluate student work. The barriers mentioned in the study by V. Gomez-Pablos et al. (2017) were also consistent with our study's findings [8]. Furthermore, the study by L. Fragoulis (2009) also encountered similar problems [6]. As teachers have no direct supervision, it is often difficult for them to assess their students' work impartially. The grading process is often compromised by the fact that only the students' final work is assessed, undermining impartiality. To make the assessment process easier for teachers, it is advisable to introduce a standardised assessment system for PBL or to establish certain assessment criteria.

To conclude, teachers generally perceive PBL positively in their teaching practice and have a favourable attitude towards the use of PBL in CLIL lessons. Nevertheless, teachers encounter various obstacles when implementing PBL in their professional practice. The problems mentioned above can be attributed to the following reasons: insufficient theoretical understanding of PBL and insufficient experience in integrating PBL into regular lessons.

Conclusion

To summarise, after using PBL, students' critical thinking and creativity improved as they used these skills to develop and present an engaging project. Thus, in line with the theory in the literature, PBL increases students' interest in the teaching and learning process in Kazakhstan, where CLIL is introduced. Moreover, the introduction of PBL in CLIL lessons is positively evaluated by both students and teachers. The students learn because they enjoy CLIL lessons through the use of PBL, a situation that is difficult to achieve with traditional teaching methods. PBL makes CLIL lessons more engaging and allows students

to actively participate in the learning process. Instead of passively listening, students now actively participate and take control of the learning process. This study shows improvements in teaching strategies, the learning process, student engagement, and academic results.

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CLIL СЫНЫБЫНДАҒЫ ЖОБАЛЫҚ ОҚЫТУ: ҚАЗАҚСТАНДЫҚ ҮЛГІ

Б. Сенгербекова¹, Қ. Смакова², В. Аваси³

^{1,2} СДУ университеті, Қаскелең, Қазақстан

³Евклид Университеті, Банги, Орталық Африка Республикасы

*e-mail: 212302001@stu.sdu.edu.kz

Андатпа. Бұл зерттеу CLIL контекстіндегі биология сабағы барысында жобалық оқытуды қолданудың оқушылардың ағылшын тілі бойынша білім деңгейінің дамуына әсерін зерттеді. Зерттеу нысаны жобалық оқыту болса, зерттеудің мақсаты жобалық оқытуды қолданудың сыныптағы CLIL технологиясының дамуына әсерін зерттеу болды. Бұл сапалық зерттеу биологияны ағылшын тілінде оқытатын үш CLIL сыныбын пайдалана отырып, бір кезеңде Қазақстанның үш мектебінде жүргізілді. Деректер сабақты бақылау мен фокус-топтармен сұхбаттар жүргізу арқылы параллельді түрде жинақталды. Зерттеу нәтижелері жобалық оқыту CLIL технологиясын енгізу кезінде сыныптағы климатты

айтарлықтай жақсартқанын және мұғалімдер де, оқушылар да жобалық оқытуды айтарлықтай үлкен көлемдегі уақыт шығыны мен топтық жұмыстағы жеке оқушылардың үлгерімін объективті бағалаудың қиындығына байланысты кемшіліктеріне қарамастан оң қабылдағанын көрсетті. Зерттеу нәтижелері мектеп басшылығына жобалық оқыту аясында CLIL тәжірибесінің сапасын жақсартуға көмектеседі.

Түйін сөздер: жобалық оқыту, CLIL, мұғалімдер, оқушылар.

ПРОЕКТНОЕ ОБУЧЕНИЕ В КЛАССЕ CLIL: КАЗАХСТАНСКАЯ МОДЕЛЬ

Б. Сенгербекова¹, К. Смакова², В. Аваси³

^{1,2} «SDU University», Каскелен, Казахстан

³ Университет Евклида, Банги, Центральноафриканская Республика

**e-mail: 212302001@stu.sdu.edu.kz*

Аннотация. В данном исследовании рассматривается влияние проектного обучения на развитие уровня знаний учащихся по английскому языку на уроке биологии в контексте CLIL. Объектом исследования было проектное обучение, а целью исследования было изучить влияние использования проектного обучения на развитие технологии CLIL в классе. Это качественное исследование проводилось в трех школах Казахстана в один период с использованием трех классов CLIL с преподаванием биологии на английском языке. Данные были собраны параллельно путем наблюдения за уроками и проведения интервью с фокус-группами. Результаты исследования показали, что проектное обучение значительно улучшило климат в классе при внедрении технологии CLIL и что как учителя, так и учащиеся положительно восприняли проектное обучение, несмотря на его недостатки из-за значительно больших затрат времени и сложности объективной оценки успеваемости отдельных учащихся в групповой работе. Результаты исследования помогут руководству школы улучшить качество опыта CLIL в рамках проектного обучения.

Ключевые слова: проектное обучение, CLIL, учителя, ученики.

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